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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yeong Soo Nam

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BRINKS HOFER GILSON & LIONE

P.O. BOX 10395

CHICAGO, IL 60610

EXAMINER

SCHECHTER, ANDREW M

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/748,699	Applicant(s) NAM ET AL.	
	Examiner Andrew Schechter	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18, 20-27 and 29-36 is/are pending in the application.
- 4a) Of the above claim(s) 11-16 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27 and 29-36 is/are allowed.
- 6) ☒ Claim(s) 1-8, 17 and 26 is/are rejected.
- 7) ☒ Claim(s) 9, 10, 18 and 20-25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Liquid crystal display device having notch in gate line".

Claim Objections

2. Claim 27 is objected to because of the following informalities: "changes a capacitance" should be "changes in a capacitance". Appropriate correction is required.

Response to Arguments

3. Applicant's arguments filed 14 December 2005 have been fully considered but they are not persuasive.

The applicant argues [pp. 8-9] that *Lee* does not disclose the arrangement of claim 1, "where the data line is bent angularly and inwardly...". This is not persuasive. First, it is the gate line which is bent in claim 1, of course. Second, the claim language does not distinguish between the structure of *Lee* and of the claimed invention. Both structures could be described as having a portion bent inwardly or as having a portion bent outwardly, and in both devices the outward portion is larger (longer horizontally)

than the inward portion, so it is not clear to the examiner how anything in the present claim language is supposed to distinguish the two.

The applicant argues [pp. 9-10] that the portion of the lower edge of the gate line where it crosses the data line is a straight line segment, so it does not anticipate the amended claim 17. This is not persuasive. By zooming in on the lines in the figure (or using a magnifying glass on a printed copy), it can be clearly seen that the gate line curves as it crosses the data line and is not in fact a straight line segment. (The same thing can be seen in Fig. 9.) The length of the boundary where a portion of the notch overlaps the data line is therefore greater than a width of the data line. However, the entirety of the notch is not disposed between an edge of the gate electrode and its associated, neighboring data line, so the claim could be distinguished from *Kang*, as discussed below.

The applicant argues [pp. 10-11] that neither of the two “notches” identified by the applicant meet the amended limitation in claim 17 of being “disposed between an edge of the gate electrode and an edge of the data line”. This is only partially persuasive. First, the examiner notes that since a notch is an indentation, only the second “notch” identified by the applicant is considered a “notch” by the examiner (namely, in Fig. 3 of *Ko*, starting at the slant in each data line and moving to the right until the slant in the middle of the pixel is reached). Second, the examiner notes that a portion of the notch in *Ko* is disposed as recited, so the examiner interprets the amended language to require that the entirety of the notch is disposed between an edge of the gate electrode and the data line. However, the claim does not recite that it is

between the gate electrode and its associated data line, or that the data line is neighboring the gate electrode, so its scope includes a gate electrode in a different pixel region, far from the recited data line, in which case the amended limitation is still met. The previous rejection is therefore applied below; the examiner suggests either of the above limitations would overcome the rejections of claim 17 in view of *Ko* (and *Kang*).

The applicant argues [pp. 11-12] that the gate line of *Kim* is not bent “angularly”, but rather are sinuous, serpentine, or wave-like. This not persuasive. Claim 2 recites a section of the bent portion of the gate line being curved, as shown in Fig. 7, just as a section of the bent portion of the gate line in *Kim* is curved. Evidently, the “angularly” in claim 1, meaning “forming an angle, sharp cornered” according to the applicant’s dictionary definition, must refer to the angle formed where the curved notch meets the straight line of the gate line. This angle can be seen in both the applicant’s Fig. 7 and in *Kim*’s Fig. 2.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 and 3-8 are rejected under 35 U.S.C. 102(b) as being anticipated by *Lee*, US 2002/0163602.

Lee discloses [see Figs. 3 and 4, for instance] an LCD comprising a substrate [31], a gate line [32] with a portion bent angularly and inwardly [on the bottom, the region not marked "S" in Fig. 3], a gate electrode [36] projecting from the gate line, a gate insulating layer [42], a data line [34] overlapping some of the bent portion of the gate line, a source electrode [38] projecting from the data line, a drain electrode [see Fig. 3], an active layer [44, 46] below the data line, source electrode, and drain electrode, and a pixel electrode [52]. Claim 1 is therefore anticipated.

The active layer overlaps an upper side of the gate electrode and predetermined portions of the source and drain electrodes, so claim 3 is also anticipated. The data line is made of Cr or Mo [paragraph 0081], so claim 4 is also anticipated. The pixel electrode is made of ITO [paragraph 0087], so claim 5 is also anticipated. There is an organic or inorganic [paragraph 0085] passivation layer [48] with a first contact hole to the drain electrode [see Fig. 5], so claims 6 and 7 are also anticipated.

Considering the additional limitations of claim 8, *Lee* also discloses the gate electrode having a portion bent angularly and inwardly [on the right side of the gate electrode, compared to the standard rectangular gate electrode], with the drain electrode overlapped with the bent portion of the gate electrode, so claim 8 is also anticipated.

6. Claim 17 is rejected under 35 U.S.C. 102(e) as being anticipated by *Kang*, U.S. Patent No. 6,900,872.

[The applied reference has a common assignee as with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.]

[This rejection might also be overcome by the filing of a certified translation of the applicant's priority document, perfecting a filing date before 14 March 2003.]

Kang discloses [see Fig. 5 for instance] an LCD with substrate, gate line, gate electrode [several pixels away to the left] projecting from gate line, gate insulating layer, data line [on the right in the figure], source electrode projecting from data line, drain electrode, active layer [127] below the data line, source electrode, and drain electrode, a pixel electrode [138], wherein a notch [on the left in the figure] is formed in a boundary of a second side [the lower side] of the gate line, and disposed between an edge of the gate electrode and an edge of the data line, such that a length of the boundary where a portion of the notch overlaps the data line is greater than a width of the data line [due to curving as discussed above]. Claim 17 is therefore anticipated.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 17, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ko et al.*, U.S. Patent No. 6,285,418, in view of *Dohjo et al.*, U.S. Patent No. 6,078,366.

Ko discloses [see Figs. 3 and 4, for instance] an LCD comprising a substrate [200] a gate line [21L], a gate electrode [the equivalent of 21G several pixels to the left] projecting on a first side [the top] of the gate line, a gate insulating layer [22], a data line [the equivalent of 25L on the right], a source electrode [the equivalent of 25S] projecting from the data line, a drain electrode [equivalent of 25D] on the gate insulating layer at a fixed interval from the source electrode, a pixel electrode [equivalent of 27], wherein a notch [on the left half of the pixel] is formed in a boundary of a second side [the bottom] of the gate line opposing the first side, and disposed between an edge of the gate electrode and an edge of the data line, such that a length of the boundary where a portion of the notch overlaps the data line is greater than a width of the data line [see Fig. 3, where the gate and data lines overlap on the right side of the drawing].

Ko does not explicitly disclose an active layer below the data line, source electrode, and drain electrode [23 is only below the source and drain electrodes]. *Dohjo* discloses [see title, Figs. 2 and 17, for instance] an active layer which is below the data line as well as the source and drain electrodes. It would have been obvious to one of ordinary skill in the art at the time of the invention to have such an active layer in the device of *Ko*, motivated by *Dohjo's* teaching that this provides higher production yield due to suppressing capacitance fluctuations and shorting, and reduces the number of

masking steps needed [col. 18, lines 42ff., for instance]. Claim 17 is therefore unpatentable.

An edge of the notch and an edge of the gate electrode are non-parallel with an edge of a portion of the gate line in which the notch is not formed, so claim 26 is also unpatentable.

9. Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kim et al.*, Korean Patent Document No. P1999-0074559 (made of record by the applicant), in view of *Dohjo et al*, U.S. Patent No. 6,078,366.

Kim discloses [see Figs. 2 and 3] an LCD comprising a substrate [1], gate line [2] having a portion bent angularly (at the edge where the sine-wave part meets the straight part) and inwardly (the parts of the sine-wave region adjacent the straight part, for instance), gate electrode [21] projecting from the gate line, gate insulating layer [3], data line [6] overlapping some of the bent portion, source electrode [61] and drain electrode [62], and pixel electrode [8].

Kim does not explicitly disclose an active layer below the data line, source electrode, and drain electrode [4 is only below the source and drain electrodes]. *Dohjo* discloses [see title, Figs. 2 and 17, for instance] an active layer which is below the data line as well as the source and drain electrodes. It would have been obvious to one of ordinary skill in the art at the time of the invention to have such an active layer in the device of *Kim*, motivated by *Dohjo's* teaching that this provides higher production yield due to suppressing capacitance fluctuations and shorting, and reduces the number of

masking steps needed [col. 18, lines 42ff., for instance]. Claim 1 is therefore unpatentable.

At least a section of the bent portion is curved, so claim 2 is also unpatentable. The active layer overlaps the upper side of the gate electrode and portions of the source and drain electrodes, so claim 3 is also unpatentable. There is a passivation layer [7] with a contact hole, so claim 6 is also unpatentable.

Allowable Subject Matter

10. Claims 9, 10, 18, and 20-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claims 27 and 29-36 are allowed.

12. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not disclose the device of claim 9, in particular the additional limitation that the bent portion of the gate line is curved. Claim 9 would therefore be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 10, in particular the additional limitation that a section of the bent portion of the gate electrode is curved. Claim 10 would therefore be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 18, in particular the additional limitation that a boundary of the gate electrode that overlaps the drain electrode greater

Art Unit: 2871

than a width of the drain electrode. Claim 18 would therefore be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 20, in particular the additional limitation that a section of the notch is disposed directly opposite to the gate electrode, so claim 20 would be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 21, in particular the additional limitation that an edge of the notch is aligned with an edge of the gate electrode, so claim 21 would be allowable if rewritten appropriately, as would claims 22 and 23 which depend from it.

The prior art does not disclose the device of claims 24 or 25, in particular the additional limitation that a width of the notch is less than a width or length of the gate electrode, so claims 24 and 25 would be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 27, in particular the additional limitation (amended from the previous claim 28) that a boundary of the gate electrode that overlaps the drain electrode is greater than a width of the drain electrode. Claim 27 is therefore allowed, as are its dependent claims 29-36.

Election/Restrictions

13. Claims 11-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Conclusion


14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Andrew Schechter
Primary Examiner
Technology Center 2800
3 March 2006